

## **ENVIRONMENTAL ISSUES CONCERNING HP DENSE PACK PROJECT**

### **AN OVERVIEW**

**Controlling Point:** Under Prevention of Significant Deterioration (PSD) rules, any modification involving capital expenditures cannot result in a significant increase in emissions. If a significant increase is likely or actual, then the modification is considered major, and best available control technology (BACT) must be installed for those pollutants that can potentially increase. So to increase capacity and not have a major modification, we must either take a permit limit or add moderate NOx controls so emissions do not increase. The bottom line is that no matter what, there can not be any increase in emissions because some rule is going to kick in to make you install controls that prevent it.

**Significant Increase:** For NOx and SOx, 40 tons /year is the limit; for PM10, 15 tons; for CO, 100 tons. Hazardous Air Pollutants are much less (i.e., lead is 0.6 tons).

**Minor Modification:** A capital project or change in operation that results in no significant increase in pollutants. This is determined by averaging two years of emissions just prior to the modification, and comparing against actual emissions annually for five years (and up to ten, at EPA's discretion) after the modification.

**Major Modification:** A project is major if a significant emissions increase occurs for ANY pollutant. The impact of being a major mod can include a year of air monitoring, then air modeling, calculations of impact to incremental consumption of ambient air, and the installation of BACT for each pollutant expected to increase.

**Synthetic Minor:** A synthetic minor modification is where an emissions increase is prevented in a "practical" sense through permit limits. That is, the facility accepts a permit limit adjustment that results in lowered emission potential for pollutants of interest. For instance, for NOx, if a permit limit of 0.50 lbs/MMBtu were lowered to 0.47 lbs/MMBtu, the net restriction of potential emissions could be counted against any increases expected from the modification. The State & EPA are reluctant to allow the use of this method for our project, since IPP is already a major source. Even though the rules allow synthetic minors, and the use of allowable emissions for determining revised emission limits have been utilized for other facilities, the current stance is that this can only be used to keep minor sources as minor sources.

**Permitting Considerations:** Capital modifications can be done without restriction (permit-wise) as long as there are no emission increases causal to the modification. (With some caveats.) But, the facility must be diligent to prove that fluctuations in emissions are due to normal operations unrelated to the mods. In our case, an operating anomaly can cause a 40 ton NOx increase in one day, and we could be hard pressed to prove the cause. Permitting flexibility is an option:

Option 1: Take your chances on no significant net increases from modifications.

Option 2: Change operation after modification to ensure no emission increase.

Option 3: Install moderate control technology sufficient to counter any increase.

Option 4: Install significant control technology to substantially decrease emissions.

Option 5: Install BACT.

Note that by adding pollution controls as part of the modification project, the project will automatically be considered a minor modification if the controls are sufficient to keep emissions below major thresholds. Also note that to make sure that no increases will result from the modifications, new permit limits may be imposed for enforcement, especially for Options 1 & 2.

**Control Technology:** For SO<sub>x</sub>, our scrubbers are close to BACT. The proposed modification includes upgrading the scrubber performance at a nominal cost. So for SO<sub>x</sub> and certain hazardous air pollutants, there will not be any increase.

For NO<sub>x</sub>, several options are available to limit increases:

**LNB's:** Low NO<sub>x</sub> burners are presently installed which provide a nominal 60% reduction from pre-combustion NO<sub>x</sub> levels. However, new generation ultra-low NO<sub>x</sub> burners are providing an additional 10% to 50% reduction in NO<sub>x</sub>. LNB's would be considered low cost moderate controls.

**FGR:** Flue gas recirculation reintroduces flue gas into the combustion air and is recirculated into the boiler. The effect is to slow combustion somewhat and produce less NO<sub>x</sub>. Cost and NO<sub>x</sub> removal capability is similar to LNB's.

**SNCR:** Selective non-catalytic reduction utilizes ammonia injection to convert NO to NO<sub>x</sub> which can be scrubbed from flue gas in the scrubber, or removed in particulate form in the baghouse. Cost is about twice that of LNB's with a little better track record on removal for the incremental increase over our present LNB's. This method requires more upkeep than LNBs, and the additional expense of ammonia use. Also, ammonium sulfate can form on air heaters and other flue path locations.

**SCR:** Selective catalytic reduction uses both ammonia and a catalyst to make significant NO<sub>x</sub> reductions up to 90% or more at about four times the cost of LNB's. This method also has increased operating expense, plus the requirement to change out catalyst beds every few years. This is not a proven technology for western low sulfur alkaline coal.

**POTPOURRI:** A combination of any of these.

**Other Considerations:** Although we cannot predict the future, there are some events on the horizon to consider:

**Mercury controls:** The EPA has decided to regulate mercury emissions from power plants. This will include MACT (most achievable control technology) to limit mercury emissions.

**SIP-Calls:** The EPA exercised Section 126 of the Clean Air Act to force utilities in 22 eastern states to meet a lowered NOx limit of 0.15 lbs/MMBtu for health reasons (smog). Although there are no plans to implement this strategy to the remaining states, it is likely to be a possibility.

**Acid Rain:** We did an early election to accept a lower NOx limit of 0.50 from 0.55 that allows us to operate until 2008 before a lower limit of 0.46 kicks in. The EPA has the authority to make this lower, even as low as 0.15, but it has not indicated as yet that it will.

**PM2.5 / Ozone Rules:** The Supreme Court just affirmed the EPA rules regulating ozone and particulate matter down to 2.5 microns. This includes precursors to ozone and PM2.5 as well, which includes NOx, Sox, reactive HAPs, and ammonia. This rule by itself could give the EPA the muscle to force 0.15 NOx limits in the near future.

**Regional Haze:** We are located in the Clean Air Corridor region in the West. New haze prevention rules will be phased in over several years to limit pollutant impacts to visibility. Older plants will have to install best available retrofit technology (BART) to meet these new standards. IPP should already be well under the limits.

**NSPS:** If the questions arises, we have reviewed New Source Performance Standards which if triggered, would kick in the 0.15 #/MMBtu standard for NOx as well. But we (and the consultant) believe NSPS will not be an issue for this project. (NOTE: This is not true for a wholly new power plant, or major reconstruction of a unit. In this case, the new plant would definitely need to meet both BACT and emission limits that are very low.)

There are three regulations that could impact IPP's operation by forcing lower limits in the future. These all target NOx, and 0.15 lbs/MMBtu seems to be the magic number. It can be imposed through acid rain rules, a SIP call, or the new PM2.5 rule.

**RECOMMENDATION:** We strongly support the project as a whole and recommend maximizing capacity and reliability. We think that our Notice of Intent (NOI) should outline all aspects of any upgrade or mod expected or needed during the project term. A submittal with all these items and the addition of moderate NOx controls (LNB or SNCR) as one package would be considered a minor modification because we can show no emission increases as a result. This combination should be readily accepted by the State DAQ. We would have to negotiate a staged approval order allowing periodic construction of the project. But no capacity increases can occur before NOx controls are added. This means we could initially take advantage of the performance improvements of the Dense Pack, but until NOx controls are in place, we could not increase capacity or emissions.

If for some reason the project was limited to only the turbine upgrades, then we would have to prove for years that it doesn't cause an increase in emissions. A scaled-back version of the project would actually cause more scrutiny by EPA and the State DAQ than full implementation of the project upgrades as a whole.